Title: Constraints on the structure of Maio Island (Cape Verde) by a three-dimensional gravity model: imaging partially exhumed magma chambers

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Abstract: We propose a 3-D gravity model for the volcanic structure of the island of Maio (Cape Verde archipelago) with the objective of solving some open questions concerning the geometry and depth of the intrusive Central Igneous Complex. A gravity survey was made covering almost the entire surface of the island. The gravity data was inverted through a non-linear 3-D approach which provided a model constructed in a random growth process. The residual Bouguer gravity field shows a single positive anomaly presenting an elliptic shape with a NWSE trending long axis. This Bouguer gravity anomaly is slightly off-centred with the island but its outline is concordant with the surface exposure of the Central Igneous Complex. The gravimetric modelling shows a high-density volume whose centre of mass is about 4500 m deep. With increasing depth, and despite the restricted gravimetric resolution, the horizontal sections of the model suggest the presence of two distinct bodies, whose relative position accounts for the elongated shape of the high positive Bouguer gravity anomaly. These bodies are interpreted as magma chambers whose coeval volcanic counterparts are no longer preserved. The orientation defined by the two bodies is similar to that of other structures known in the southern group of the Cape Verde islands, thus suggesting a possible structural control constraining the location of the plutonic intrusions.

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